

CLAIMS

1. An electroluminescence device comprising a pair of electrodes and a layer of an organic light emitting medium disposed between the pair of electrodes, wherein the layer of an organic light emitting medium comprises:

(A) at least one compound selected from substituted and unsubstituted arylamines having 10 to 100 carbon atoms, and

(B) at least one compound selected from:

anthracene derivatives represented by following general formula (I):



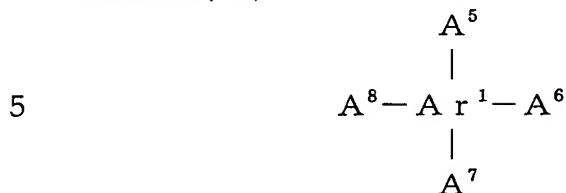
wherein A^1 and A^2 each independently represent a substituted or unsubstituted monophenylanthryl group or a substituted or unsubstituted diphenylanthryl group and may represent a same group or different groups, and L represents a single bond or a divalent bonding group,

anthracene derivatives represented by following general formula (II):



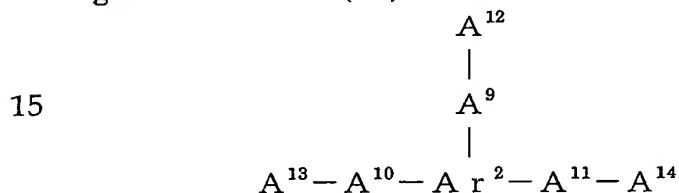
wherein An represents a substituted or unsubstituted divalent anthracene residue group, A^3 and A^4 each independently represent a substituted or unsubstituted aryl group having 6 to 40 carbon atoms, at least one of A^3 and A^4 represents a substituted or unsubstituted monovalent condensed aromatic ring group or a substituted or unsubstituted aryl group having 10 or more carbon atoms, and A^3 and A^4 may represent a same group or different groups,

spirofluorene derivatives represented by following general formula (III):



wherein Ar¹ represents a substituted or unsubstituted spirofluorene residue group, A⁵ to A⁸ each independently represent a substituted or unsubstituted aryl group having 6 to 40 carbon atoms,

compounds having condensed rings represented by following general formula (IV):



wherein Ar² represents a substituted or unsubstituted aromatic ring group having 6 to 40 carbon atoms, A⁹ to A¹¹ each independently represent a substituted or unsubstituted arylene group having 6 to 40 carbon atoms, A¹² to A¹⁴ each independently represent hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, an aryloxy group having 5 to 18 carbon atoms, an aralkyloxy group having 7 to 18 carbon atoms, an arylamino group having 5 to 16 carbon atoms, nitro group, cyano group, an ester group having 1 to 6 carbon atoms or a halogen atom, and at least one of A⁹ to A¹⁴ represents a group having condensed aromatic rings, and metal complex compounds.

2. An electroluminescence device comprising a pair of electrodes and a

layer of an organic light emitting medium disposed between the pair of electrodes, wherein the layer of an organic light emitting medium comprises:

(A) at least one compound selected from substituted and unsubstituted arylamines having 10 to 100 carbon atoms, and

(B) at least one compound selected from:

anthracene derivatives represented by following general formula (I):



wherein A^1 and A^2 each independently represent a substituted or unsubstituted monophenylanthryl group or a substituted or unsubstituted diphenylanthryl group and may represent a same group or different groups, and L represents a single bond or a divalent bonding group, and

anthracene derivatives represented by following general formula (II):

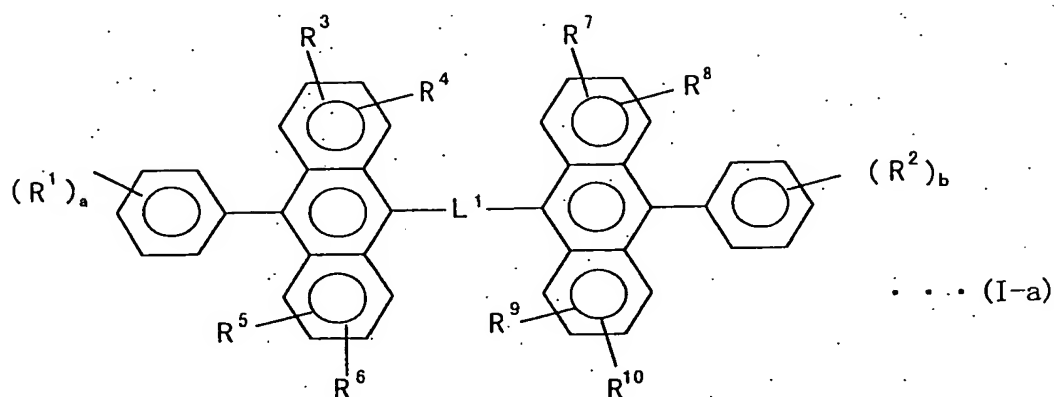


wherein An represents a substituted or unsubstituted divalent anthracene residue group, A^3 and A^4 each independently represent a substituted or unsubstituted aryl group having 6 to 40 carbon atoms, at least one of A^3 and A^4 represents a substituted or unsubstituted monovalent condensed aromatic ring group or a substituted or unsubstituted aryl group having 10 or more carbon atoms, and A^3 and A^4 may represent a same group or different groups.

3. An electroluminescence device according to any one of Claims 1 and 2, wherein the anthracene derivative represented by general formula (I) of

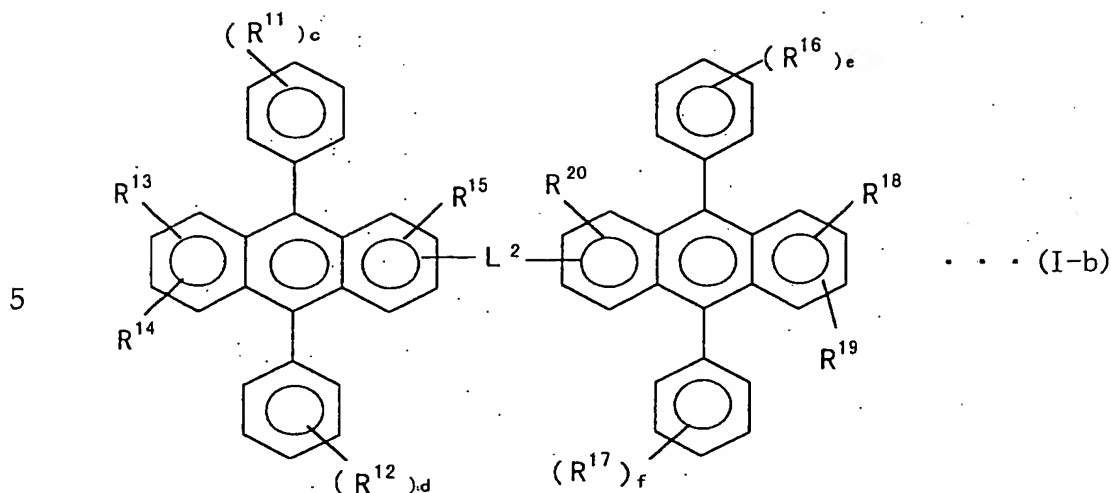
component (B) is:

an anthracene derivative represented by following general formula
(I-a):



wherein R¹ to R¹⁰ each independently represent hydrogen atom, an alkyl group, a cycloalkyl group, an aryl group which may be substituted, an alkoxy group, an aryloxy group, an alkylamino group, an alkenyl group, an arylamino group or a heterocyclic group which may be substituted, a and b each represent an integer of 1 to 5, atoms or groups represented by a plurality of R¹ and R² may be a same with or different from each other and may be bonded to each other to form a ring when a and b each represent an integer of 2 or greater, groups represented by combinations of R³ and R⁴, R⁵ and R⁶, R⁷ and R⁸, and R⁹ and R¹⁰ may be bonded to each other to form a ring, and L¹ represents a single bond, -O-, -S-, -N(R)-, R representing an alkyl group or an aryl group which may be substituted, an alkylene group or an arylene group, or

an anthracene derivative represented by following general formula
(I-b):



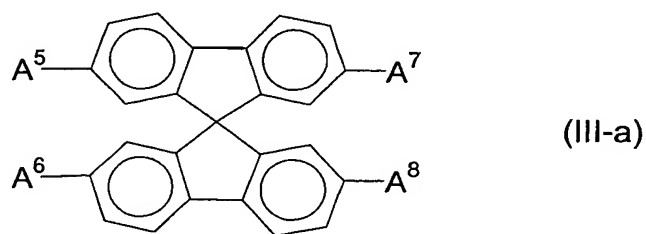
wherein R¹¹ to R²⁰ each independently represent hydrogen atom, an alkyl group, a cycloalkyl group, an aryl group which may be substituted, an alkoxy group, an aryloxy group, an alkylamino group, an arylamino group or a heterocyclic group which may be substituted, c, d, e and f each represent an integer of 1 to 5, atoms or groups represented by a plurality of R¹¹, R¹², R¹⁶ and R¹⁷ may be a same with or different from each other and may be bonded to each other to form a ring when c, d, e and f each represent an integer of 2 or greater, groups represented by combinations of R¹³ and R¹⁴, and R¹⁸ and R¹⁹ may be bonded to each other to form a ring, and L² represents a single bond, -O-, -S-, -N(R)-, R representing an alkyl group or an aryl group which may be substituted, an alkylene group or an arylene group.

4. An electroluminescence device according to Claim 1, wherein the anthracene derivative represented by general formula (II) of component (B) is an anthracene derivative represented by following general formula (II-a):



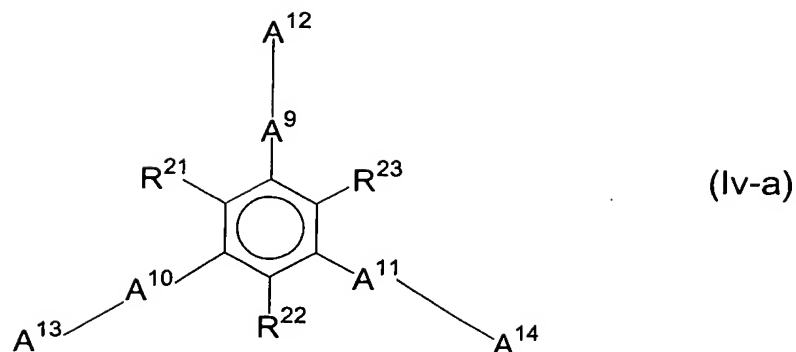
wherein An represents a substituted or unsubstituted divalent anthracene residue group and X¹ and X² each independently represent a monovalent residue group derived from naphthalene, phenanthrene, fluoranthene, anthracene, pyrene, perylene, coronene, chrysene, picene, 5 diphenylanthracene, carbazole, triphenylene, rubicene, benzoanthracene, phenylanthracene, bisanthracene, dianthracenylbenzene or dibenzoanthracene, which may be substituted or unsubstituted.

5. An electroluminescence device according to any one of Claims 1 and 2, 10 wherein the spirofluorene derivative represented by general formula (III) of component (B) is a spirofluorene derivative represented by following general formula (III-a):



wherein A⁵ to A⁸ each independently represent a substituted or unsubstituted biphenyl group or a substituted or unsubstituted naphthyl 15 group.

6. An electroluminescence device according to any one of Claims 1 and 2, wherein the compound having condensed rings represented by general formula (IV) of component (B) is a compound having condensed rings 20 represented by following general formula (IV-a):



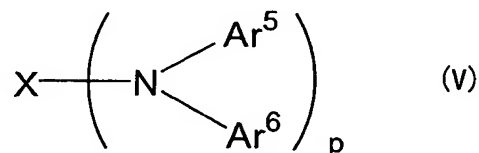
wherein A^9 to A^{14} are as defined above, R^{21} to R^{23} each independently represent hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, an aryloxy group having 5 to 18 carbon atoms, an aralkyloxy group having 7 to 18 carbon atoms, an arylamino group having 5 to 16 carbon atoms, nitro group, cyano group, an ester group having 1 to 6 carbon atoms or a halogen atom, and at least one of A^9 to A^{14} represents a group having condensed aromatic rings having at least 3 rings.

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7. An electroluminescence device according to any one of Claims 1 and 2, wherein the metal complex compound of component (B) is an aluminum chelate complex compound.

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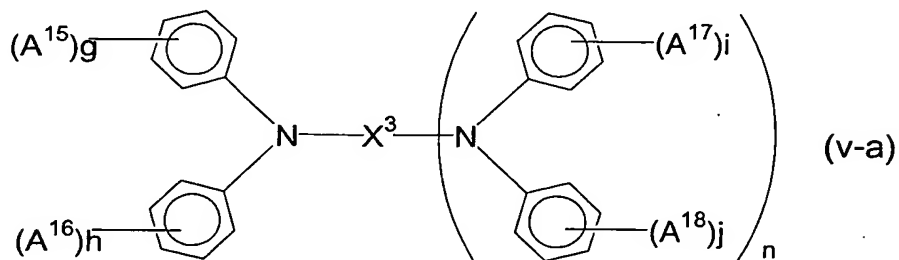
8. An electroluminescence device according to any one of Claims 1 and 2, wherein component (A) is at least one compound selected from arylamine compounds represented by following general formula (V):



wherein X^3 represents a substituted or unsubstituted condensed aromatic ring group having 10 to 40 nuclear carbon atoms, Ar^5 and Ar^6 each independently represent a substituted or unsubstituted monovalent aromatic group having 6 to 40 carbon atoms, and p represents an integer of 1 to 4.

9. An electroluminescence device according to Claim 8, wherein X^3 in general formula (V) represents a residue group derived from naphthalene, phenanthrene, fluoranthene, anthracene, pyrene, perylene, coronene, chrysene, picene, diphenylanthracene, fluorene, triphenylene, rubicene, benzoanthracene, phenylanthracene, bisanthracene, dianthracenylbenzene or dibenzoanthracene.

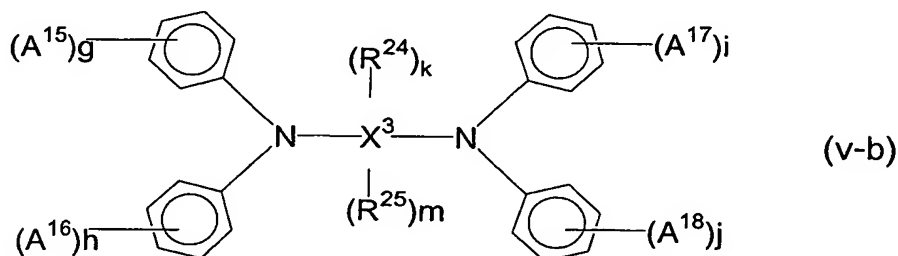
10. An electroluminescence device according to any one of Claims 1 and 2, wherein component (A) is at least one compound selected from arylamines represented by following general formula (V-a):



wherein X^3 represents a substituted or unsubstituted condensed aromatic ring group having 10 to 40 nuclear carbon atoms, Ar^{15} to Ar^{18} each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 50 carbon atoms, a substituted or unsubstituted aryl group having 5 to 50 carbon atoms, a substituted or unsubstituted

aralkyl group having 7 to 50 carbon atoms, a substituted or unsubstituted cycloalkyl group having 3 to 50 carbon atoms, a substituted or unsubstituted alkoxyl group having 1 to 50 carbon atoms, a substituted or unsubstituted aryloxy group having 5 to 50 carbon atoms, a substituted or unsubstituted arylamino group having 5 to 50 carbon atoms or a substituted or unsubstituted alkylamino group having 1 to 20 carbon atoms, g, h, i and j each represent an integer of 0 to 5, n represents an integer of 0 to 3, atoms and groups represented by a plurality of Ar¹⁵ to Ar¹⁸ may be the same with or different from each other and may be bonded to each other to form a saturated or unsaturated ring when g, h, i and j each represent an integer of 2 or greater, and at least one of Ar¹⁵ to Ar¹⁸ represents a substituted or unsubstituted secondary or tertiary alkyl group having 3 to 10 carbon atoms.

11. An electroluminescence device according to any one of Claims 1 and 2, wherein component (A) is at least one compound selected from arylamines represented by following general formula (V-b):



wherein X³ represents a substituted or unsubstituted condensed aromatic ring group having 10 to 40 nuclear carbon atoms, Ar¹⁵ to Ar¹⁸ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 50 carbon atoms, a substituted or unsubstituted

aryl group having 5 to 50 carbon atoms, a substituted or unsubstituted aralkyl group having 7 to 50 carbon atoms, a substituted or unsubstituted cycloalkyl group having 3 to 50 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 50 carbon atoms, a substituted or unsubstituted aryloxy group having 5 to 50 carbon atoms, a substituted or unsubstituted arylamino group having 5 to 50 carbon atoms or a substituted or unsubstituted alkylamino group having 1 to 20 carbon atoms, g, h, i and j each represent an integer of 0 to 5, and atoms and groups represented by a plurality of Ar¹⁵ to Ar¹⁸ may be a same with or different from each other and may be bonded to each other to form a saturated or unsaturated ring when g, h, i and j each represent an integer of 2 or greater,

R²⁴ and R²⁵ each independently represent hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms, a substituted or unsubstituted aralkyl group having 7 to 50 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 50 carbon atoms or a substituted or unsubstituted aryloxy group having 5 to 50 carbon atoms, k and m each represent an integer of 0 to 2, and at least one of R²⁴ and R²⁵ represents a substituted or unsubstituted secondary or tertiary alkyl group having 3 to 10 carbon atoms.

12. An electroluminescence device according to any one of Claims 1 and 2, wherein the layer of an organic light emitting medium comprises component (A) and component (B) in amounts such that a ratio of an amount by weight of component (A) to an amount by weight of component

(B) is in a range of 1:99 to 20:80.

13. An electroluminescence device according to any one of Claims 1 and 2,
wherein a layer of a chalcogenide, a layer of a metal halide or a layer of a
5 metal oxide is disposed at least on one surface of the pair of electrodes.

14. An electroluminescence device according to any one of Claims 1 and 2,
wherein a mixed region comprising a reducing dopant and organic
substances or a mixed region comprising an oxidizing dopant and organic
10 substances is disposed at least on one surface of the pair of electrodes.

15. An electroluminescence device according to any one of Claims 1 and 2,
wherein the layer of an organic light emitting medium has a thickness in a
range of 10 to 400 nm.

16. An organic light emitting medium which comprises:

(A) at least one compound selected from substituted and
unsubstituted arylamines having 10 to 100 carbon atoms, and

(B) at least one compound selected from:

20 anthracene derivatives represented by following general
formula (I):



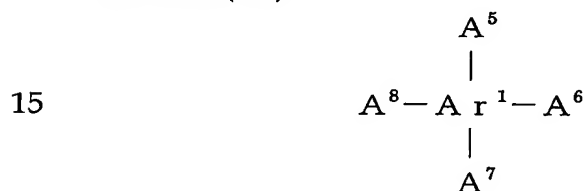
wherein A^1 and A^2 each independently represent a substituted or
unsubstituted monophenylanthryl group or a substituted or unsubstituted
25 diphenylanthryl group and may represent a same group or different
groups, and L represents a single bond or a divalent bonding group,

anthracene derivatives represented by following general formula (II):



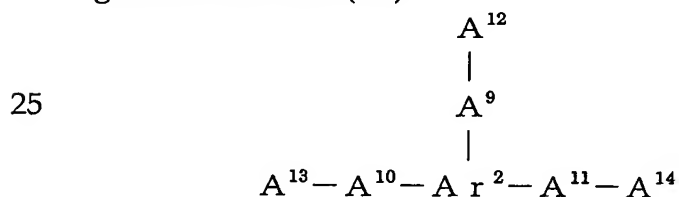
wherein An represents a substituted or unsubstituted divalent anthracene residue group, A³ and A⁴ each independently represent a substituted or unsubstituted aryl group having 6 to 40 carbon atoms, at least one of A³ and A⁴ represents a substituted or unsubstituted monovalent condensed aromatic ring group or a substituted or unsubstituted aryl group having 10 or more carbon atoms, and A³ and A⁴ may represent a same group or different groups,

spirofluorene derivatives represented by following general formula (III):



wherein Ar¹ represents a substituted or unsubstituted spirofluorene residue group, A⁵ to A⁸ each independently represent a substituted or unsubstituted aryl group having 6 to 40 carbon atoms,

compounds having condensed rings represented by following general formula (IV):



wherein Ar² represents a substituted or unsubstituted aromatic ring group having 6 to 40 carbon atoms, A⁹ to A¹¹ each independently represent a substituted or unsubstituted arylene group having 6 to 40 carbon atoms,

A¹² to A¹⁴ each independently represent hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms, an alkoxyl group having 1 to 6 carbon atoms, an aryloxyl group having 5 to 18 carbon atoms, an aralkyloxyl group having 7 to 18 carbon atoms, an
5 arylamino group having 5 to 16 carbon atoms, nitro group, cyano group, an ester group having 1 to 6 carbon atoms or a halogen atom, and at least one of A⁹ to A¹⁴ represents a group having condensed aromatic rings, and
metal complex compounds.

10 17. An organic light emitting medium which comprises:

(A) at least one compound selected from substituted and unsubstituted arylamines having 10 to 100 carbon atoms, and

(B) at least one compound selected from:

anthracene derivatives represented by following general
15 formula (I):



wherein A¹ and A² each independently represent a substituted or unsubstituted monophenylanthryl group or a substituted or unsubstituted diphenylanthryl group and may represent a same group or different
20 groups, and L represents a single bond or a divalent bonding group, and

anthracene derivatives represented by following general formula (II):



wherein An represents a substituted or unsubstituted divalent anthracene
25 residue group, A³ and A⁴ each independently represent a substituted or unsubstituted aryl group having 6 to 40 carbon atoms, at least one of A³

and A⁴ represents a substituted or unsubstituted monovalent condensed aromatic ring group or a substituted or unsubstituted aryl group having 10 or more carbon atoms, and A³ and A⁴ may represent a same group or different groups.